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(54) Nut fastener

(57) A nut fastener comprises a one-piece clamping device (10) which, in use, engages the edge of a flat structural part, for example, sheet metal. The fastener holds a nut (12) for screw on bolt to be inserted through a hole in the structural part into the nut (12). The fastener is coated with plastics material (18) to reduce the risk of scratching of any coating of the structural part.

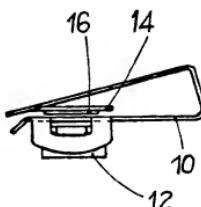


FIG. 2.

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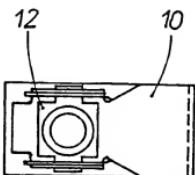


FIG. 1

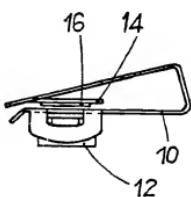


FIG. 2

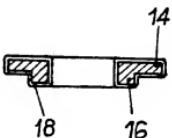


FIG. 3

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## SPECIFICATION

## Nut fastener

5 The invention relates to a nut fastener comprising a one-piece or multipart flexible clamping device which, in use, grips the edge of a flat structural part and which holds a nut for a screw or bolt to be inserted through a hole in the structural part and into the nut.

Nut fasteners of this type are known in numerous variations in one-piece and multipart design (see for example German AS 2 059 006, German OS 23 13 753, German OS 24 18 124, German OS 24 08 837 and German PS 1110 956). They are used in the sheet-metal working industry, in particular in the motor-vehicle industry and in aircraft construction, for the purpose of quickly and reliably connecting parts to relatively thin sheet metal.

The known clamping devices normally consist of steel and in the assembled condition are widely exposed to corrosion. This danger is particularly great if the sheet metal and supports to which the nut fasteners are clamped consist of a different material, for example aluminium, and humidity or moisture, for example as a result of condensation, 30 occur at the connection point.

Previously it was thought that this defect could be overcome by providing the sheet metal or supports with a protective surface, for example by anodizing. According to the 35 shape of the nut fastener, this surface coating is often scratched during installation of the nut fastener and then becomes ineffective at the critical location. Correspondingly it would be assumed, conversely, that any protective 40 layer on the nut fastener would also be damaged. It has thus been proposed to manufacture the nut fastener of stainless spring steel. Unfortunately, this material can be machined only with difficulty, so that these nut fasteners 45 are relatively expensive. Furthermore, in this way the problem of possible damage to an anodized coating is still not solved.

Finally, it is known to connect the nut fastener with a special plastics part which one 50 one side is pressed against the support and thus prevents scratching and corrosion on this side. This procedure is also relatively expensive and complicated, and does not offer the necessary overall protection.

55 The invention provides a nut fastener comprising a one-piece or multipart flexible clamping device which, in use, grips the edge of a flat structural part and holds a nut for a screw or bolt to be inserted through a hole in the structural part, characterised in that the nut fastener is provided with a coating of plastics material. An advantage of the nut fastener described above is that even in embodiments 60 consisting of conventional, easily treated 65 spring steel, no corrosion takes place and

damage to the surface of the sheet metal and supports is effectively prevented.

The nut fastener described above not only utilises the enveloping and insulating properties of the plastics coating but also takes advantage of the fact that plastics coatings are usually outwardly rounded even at sharp edges of the coated articles. Depending on the coating process, the plastics coating may 75 even be especially thick at the edges. In this way damage to an anodized coating is immediately prevented in the present context.

The proposed plastics coating also does not counteract the spring properties of the clamping 80 device of the nut fasteners, since the plastics material itself is flexible.

In a preferred embodiment of the invention, the plastics coating is applied using the fluidized-bed coating process. A process of this 85 type is known, for in which there is used a polyamide 11-fine powder. In addition to this there are, of course, other known possibilities of effecting the coating.

One example of embodiment of the invention is described below and illustrated in the drawings which show a nut fastener and nut in top view in Fig. 1, side view in Fig. 2 and enlarged partial section in Fig. 3.

The illustrated nut fastener is a one-piece 95 clip 10 which is so designed that, it forms a resilient clamping device and, retains a nut 12 with a certain amount of axial play and secured against rotation.

The arm of the clip 10 opposite the nut 12 100 is bent to form a lug or tongue 14 with a centering projection 16 which engages in a bore in a metal sheet or support to which the nut fastener is clamped. In the usual embodiment the clip 10 contains of readily machined 105 spring steel, whereas for the nut 12 stainless steel is normally used, which is conventionally passivated, silver-plated or molybdenum coated.

To protect the clip 10 from corrosion and to 110 prevent any scratching of an anodized coating on the sheet metal, for example by the sharp edges of the centering projection 16, the entire clip 10 is coated with plastics material. This layer is designated 18 in the enlarged 115 partial section through the lug 14 and, preferably, is produced using the fluidized-bed coating process. The clip 10 is here already in its final shape. The nut 12 can be engaged in its positive mounting after the coating of the clip 120 10. The plastics coating 18 allows both the elastic mobility of the tabs on the clip 10 holding the nut 12 and the flexing of the arms of the clip during its fitting on to a metal sheet.

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## CLAIMS

1. A nut fastener comprising a one-piece or multipart flexible clamping device which, in use, grips the edge of a flat structural part and which holds a nut for a screw or bolt to be inserted through a hole in the structural part, characterised in that the nut fastener is provided with a coating of plastics material.

130 holds a nut for a screw or bolt to be inserted

through a hole in the structural part, characterised in that the nut fastener is provided with a coating of plastics material.

2. A nut fastener as claimed in claim 1, characterised in that the coating of plastics material consists of a layer of powder fused by applying heat.
3. A nut fastener substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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